

## Beech 76 Duchess, G-CBBF

<b>AAIB Bulletin No: 7/2004</b>	<b>Ref: EW/G2004/03/06</b>	<b>Category: 1.3</b>
<b>Aircraft Type and Registration:</b>	Beech 76 Duchess, G-CBBF	
<b>No &amp; Type of Engines:</b>	2 Lycoming O-360-A1G6D piston engines	
<b>Year of Manufacture:</b>	1980	
<b>Date &amp; Time (UTC):</b>	10 March 2004 at 1338 hrs	
<b>Location:</b>	Bournemouth Airport, Dorset	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 2	Passengers - None
<b>Injuries:</b>	Crew - None	Passengers - N/A
<b>Nature of Damage:</b>	Damage to right-hand propeller, access footstep and portions of right-hand flap	
<b>Commander's Licence:</b>	Private Pilot's Licence	
<b>Commander's Age:</b>	59 years	
<b>Commander's Flying Experience:</b>	369 hours (of which 6 were on type)	
	Last 90 days - 11 hours	
	Last 28 days - 2 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

### History of the flight

The aircraft was returning to Bournemouth after a flight to Haverfordwest. The weather was good, with the cloud base at 3,500 feet and the wind from 030° at 13 kt. The pilot contacted Bournemouth Radar and was given vectors for an ILS approach to Runway 08. The pilot reports that he lowered the landing gear whilst still level at 2,000 feet and confirmed that he had 'three greens'.

On final approach the pilot selected two stages of flap and adopted a slight 'crab' to offset the crosswind from the left, reducing this as the aircraft descended. The touchdown was close to the runway centre line, on both main wheels, and appeared to be normal until the right wing started to drop and the right propeller contacted the runway surface. The pilot applied full left aileron and, initially, there was sufficient airspeed to lift the right wing but, as the airspeed decayed, the right wing dropped again and the aircraft curved to the right, coming to rest on the grass after turning through more than 90°. The pilot turned off the aircraft's electrical switches and fuel and he and his passenger made a safe exit.

## **Aircraft examination**

The initial inspection showed that the right main landing gear leg had folded upwards although the other two legs were still down and locked.

After the aircraft had been recovered to the hangar of the maintenance organisation, it was put on jacks and the landing gear system functioned. In this aircraft the landing gear position is controlled by a simple two-position electrical switch in the cockpit and hydraulic power is provided to the individual landing gear actuators by an electrically-driven pump. During extension, this pump provides pressure to the 'extend' side of the actuators and pressure is maintained until the downlock microswitches are closed on all three legs, with each leg held locked by a mechanical overcentre linkage. The hydraulic motor then switches off and the system pressure decays. If any of the three downlock microswitches opens while the landing gear selection is 'DOWN', the hydraulic pump is immediately activated and supplies pressure to the 'extend' side of all three landing gear actuators until the three downlock microswitches are again closed.

In the hangar it was found that there was a significant internal leak within the actuator for the nose landing gear, resulting in an effective bypassing between the 'extend' and 'retract' sides of the piston. This would have very substantially reduced the 'extend' pressure available at all the landing gear actuators if one of the downlock switches opened because of movement of one of the landing gear legs away from the downlock position.

As part of the examination, all three landing gears were removed from the aircraft and dimensionally inspected on a flat surface as specified in the manufacturer's maintenance manual, to check for the overcentre travel of the side brace. This inspection showed the right landing gear as being slightly outside the manufacturer's minimum dimension for overcentre travel. Checking of this dimension is not a part of the normal inspection schedule for this type.

It is, therefore, most likely that, during the landing run at Bournemouth, the crosswind generated a side load on the right landing gear leg, causing it to move from its overcentre position. Because of the internal leak in the nose leg actuator, the electrically-driven hydraulic pump was unable to generate sufficient 'extend' pressure to prevent the right leg from folding upwards and allowing the right wing to drop.